

TRITIUM DETECTION IN PLASMA FACING COMPONENT BY IMAGING PLATE TECHNIQUE

K. Miyasaka^a, T. Tanabe^b, V. Philipps^c, M. Rubel^d, N. Miya^e and K. Masaki^e

^a *Department of Nuclear Engineering, Graduate School of Engineering, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-8603, Japan*

^b *Center for Integrated Research in Science and Engineering, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-8603, Japan*

^c *Institut für Plasmaphysik, Forschungszentrum Jülich GmbH, EURATOM Association, Trilateral Euregio Cluster, 52425 Jülich, Germany*

^d *Alfvén Laboratory, Royal Institute of Technology, S-100 44 Stockholm, Sweden*

^e *Department of Fusion Facilities, Japan Atomic Energy Research Institute, Naka-cho, Naka-gun, Ibaraki 311-0193, Japan*

In JET and TFTR, tritium measurements for plasma facing tiles have been performed. It is found that the immediate retention was about 45 % and 30 % in JET and TFTR, respectively. After excessive tritium removal procedure (D-operation, D₂ and He-glow, O₂-venting), a remaining long term T-retention was reduced to be ~16 and ~13 %, respectively. Total remaining amounts are still huge. Therefore determination of tritium distribution in vessel components is urgently necessary. The purpose of determination of tritium retention is not limited to estimate tritium inventory in fusion reactors. The tritium distribution also gives useful information on hydrogen recycling. In this work imaging plate (IP) technique [Fusion Eng. & Design 54 (2001) 147-149] has been applied for determination of tritium distribution on the graphite tiles in TEXTOR and JT-60U.

In a device like TEXTOR, the high-energy tritons are decoupled from the (thermalized) deuterons and have also a different behavior of retention: the main retention mechanism is deep implantation rather than co-deposition with eroded carbon on re-deposition dominated areas.

The results for JT-60 divertor tiles show very clear temperature dependence. At the highest temperature region i.e. at the foot point of both outer and inner divertors, more or less no tritium was detected. This is probably due to tritium being injected into the tiles after mostly slowed down in the JT-60 divertor.